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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/496,794	02/02/2000	John T. Moore	MICT-0005-D1-US	6700

7590 07/31/2002
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EXAMINER

OWENS, DOUGLAS W

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 07/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/496,794

Applicant(s)

MOORE ET AL.

Examiner

Douglas W Owens

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-31, 33 and 34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-31, 33 and 34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 31, 33 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by US patent No. 6,271,561 to Doan.

Regarding claim 31, Doan teaches a semiconductor device, comprising:

a trench filler material (26); and

a second material (42) deposited on the trench filler material.

Doan does not explicitly teach a device, wherein the etch rate of the second material is less than 1.2 times the etch rate of the trench filler material. The trench filler material taught by Doan would have inherently had an etch rate that is less than 1.2 times the first etch rate since it is the same material, formed using the same method (Col. 5, lines 4-9 and Col. 6, lines 30-35).

Doan does not teach annealing the second material at a temperature of at least 900 degrees Celsius. This is considered a product-by-process limitation. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claim 33, Doan teaches a semiconductor device, wherein the second material and the trench filler material include silicon dioxide.

Regarding claim 34, Doan does not teach a semiconductor device, wherein the second material is thermally grown. This is considered a product-by-process limitation as discussed above.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent No. 5,433,794 to Fazan et al.

Regarding claims 26-30, Fazan et al. teaches a semiconductor structure, comprising:

- a support (1);
- a first material (2) having a first etch rate;
- a trench formed through the first material and into the support; and
- a trench filler material (4) having an etch rate.

Fazan et al. teaches a pad oxide that is deposited on the substrate (Col. 2, lines 55-57) and a CVD, TEOS or similar filler material is used in the trench (Col. 3, lines 12-15). Fazan et al. does not explicitly teach a trench filler material that has an etch rate that is similar to or less than that of the first material. Since Fazan et al. teaches that the pad oxide is deposited, one of ordinary skill in the art would have been left to choose a conventional method of depositing the pad oxide, such as CVD from TEOS. It is apparent that a CVD from TEOS first material would have had the same etch rate as that of a CVD from TEOS filler material. It would have been obvious to one of ordinary skill in the art to select CVD oxide or TEOS for the first material as a matter of design choice. Since it would have been obvious to deposit the same material on the substrate as the material used for the trench filler, the trench filler would have had an etch rate that is 1 times the etch rate of the first material, which is less than 1.2 times that etch rate.

Response to Arguments

5. Applicant's arguments filed May 6, 2002 have been fully considered but they are not persuasive.

The applicant argues that Doan does not teach the claimed etch ratio. Doan teaches a trench-filler material and a second material that can comprise identical

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materials. It would have been left to one of ordinary skill to select from the materials listed. Furthermore, there is nothing to preclude one of ordinary skill from selecting the same material for the trench-filler and the second material. Identical materials would have had identical etch rates. Therefore, the etch rate of the second material would have been one times the rate of the trench filler material, which is less than 1.2 times the rate of the trench filler material.

6. Applicant's arguments with respect to claims 26-30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W Owens whose telephone number is 703-308-6167. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

DWO
July 28, 2002

Steven Lake
Primary Examiner

